

known, however, respecting the anatomical relations of the soft parts of a Crinoid; while the morphology of the Echinoderms generally was far from being properly understood; and in most cases the group was regarded as consisting of four or five divisions of equal value, which were considered as classes or orders according to the position assigned to the Echinoderms generally in the animal kingdom. The Ophiurids and Asterids have sometimes been united into one group, the Stellerids, which, though convenient for purposes of reference, appears to me to be somewhat too comprehensive. Considering the totally dissimilar modes of development, and the great difference in anatomical structure between a Brittle-star and a Starfish, I find it difficult to do otherwise than regard the Ophiuroidea and Asteroidea as independent classes of Echinoderms, of equal systematic value with Echinoidea and Holothuroidea.

In like manner, I should rank the Blastoidea and Cystidea as classes of the Echinoderms rather than as sub-classes or orders of the Crinoidea. The essential difference between them and the true Crinoids (*Eucrinoidea* of Zittel and de Loriol) is the presence in the latter of branching articulated arms developed above the radial plates of the calyx; while the symmetrical composition of the calyx in the Blastoids, the complexity of their ambulacra, and the regular arrangement of their hydrospires, sharply distinguish them from most of the Cystids, the morphological characters of which are, as it were, more plastic and less crystalline.

These three groups, however, the true Crinoids, the Blastoids, and the Cystids, are distinguished from the remainder of the Echinoderms by certain very definite peculiarities, *i.e.*, the more or less permanent attachment of the aboral surface of the body, and the absence of any locomotor organs in connection with the ambulacral system. For the lateral branches of the water-vessels, when present, are simple respiratory tentacles of an altogether different nature from the tube-feet of an Echinid or Stellerid.

Important as these differences are, few zoologists seem to have recognised them as of any greater systematic value than those between an Urchin and a Starfish, Crinoidea, Asteroidea, and Echinoidea having been generally regarded as equivalent divisions of Echinoderms. As long ago as 1848, however, Leuckart separated the stalked Echinoderms from the remainder of the group under the name "Pelmatozoa." This suggestion seems to have been adopted by Bronn in 1860,¹ while Leuckart classed the Echinoderms in accordance with it in his annual "Berichte;" but little notice was taken of it in this country except by Sir Wyville Thomson, as will be seen further on. In 1869 Prof. Huxley² recognised the same principle when he wrote "The Crinoids are so different from the other living Echinodermata that they will probably have to form a distinct primary division or sub-class of the class; and this may possibly be the

¹ Die Klassen und Ordnungen des Thier-Reichs, Bd. ii., Aktinozoen, 1860, pp. 3, 421.

² An Introduction to the Classification of Animals, London, 1869, p. 130.